**Notebook Series -- Notebooks by Experimenters Other Than Edison**
**Battery Experiments -- Cell Test Books -- Large Cell Tests**
**Notebook, N-10-04-25**

This notebook was used by Walter E. Holland during April 1910-September 1911 for daily reports on all large, or commercial type, battery cells undergoing regular tests. A description of the contents of the book appears on the first page. The subsequent entries provide data regarding the tests, including information on the type and output of the cells tested, rates of charging, and initials of the reviewer. Most of the entries on the first 33 pages are initialed by Edison. The later entries are initialed by Holland or Harold H. Smith. The front cover is labeled "Daily Report of Large Cell Tests. Vol. I. 4/25/10." The book contains 200 numbered pages, some of which are blank.

Only the initial description and the pages initialed by Edison have been selected.

April 25, 1910.

Commencing with this date a daily report will be made in this book of all large cells (commercial types) which are undergoing regular test.

Regular tests are made at normal rates (unless otherwise noted), which are as follows:

A4 30 amps
A6 45 "
A8 60 "
Ignition Cell (4 plates) 15 amps

Cells are tested (regularly) on 15-hr and 7-hr charges at normal rate.

The first 3 runs of new cells are known as "forming runs". On these, cells are charged specially, as follows:

1st run: Chg. 48 hrs. at ½-normal rate.

2nd + 3rd runs: Chg. 24 hrs. – 10 hrs. at normal, 14 hrs. at ½-normal rate.

Between each series of reg. tests cells are run on the Endurance Test, where they charge 7 hrs. at 30 amps and discharge at 40 amps (A4 type) to zero.

Output to 1V and to .5V on 15-hr. charge at normal rate.

| Run – | 394 | 395 | 396 | | |
|---|---|---|---|---|---|
| Date – | 4/20/10 | 4/21 | 4/22 | | |
| A4 #B2 | 175.5 – 200 | 181.2 – 198.2 | 182.5 – 197.5 | | |
| " #B3 | 170 – 192.5 | 178 – 193.5 | 180 – 194.7 | | |

| Run | 384 | 385 | 386 | | |
|---|---|---|---|---|---|
| Date | 4/20/10 | 4/21 | 4/22 | | |
| A4 #775 | 185.5 – 207 | 185 – 205 | 185.5 – 204 | | |

| Run | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| Date | 4/19/10 | 4/21 | 4/22 | 4/23 | |
| A4 #15593 | 198 – 205.7 | 187 – 196 | 186.7 – 195.7 | 182.5 – 192.2 | (48) |
| " 15594 | 203.5 – 217.7 | 187 – 198 | 185 – 193.5 | 179 – 188 | (24) |
| " 15595 | 205 – 217.7 | 189.7 – 199.7 | 186.7 – 196.5 | 182.2 – 192 | (36) |

N.B. – On the 3 first runs, new cells are

| Run | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Date | 4/19/10 | 4/21 | 4/22 | 4/23 |
| A4 #155 | 202.5 – 210 | 187 – 191.5 | 185 – 189 | 180.7 – 185 |

N.B. – Cells are charged at special rates



Output to 1V on 7-hr. charge at normal rate.

| | 397 | 398 | 399 | 400 | | |
|---|---|---|---|---|---|---|
| | 4/22 | 4/23 | 4/25 | 4/25 | | ✓ |
| | 152.5 | 155 | 154.5 | 153 | | |
| | 150 | 151.5 | 151.7 | 151.5 | 164 | |

| | 387 | 388 | 389 | 390 | | |
|---|---|---|---|---|---|---|
| | 4/22 | 4/23 | 4/25 | 4/25 | 164 | ✓ |
| | 154.7 | 161.2 | 162 | 162.5 | | |

| | 6 | 7 | 8 | 9 | | |
|---|---|---|---|---|---|---|
| | 4/26 | 4/26 | 4/27 | 4/27 | | |
| | 162 | 166.2 | 169.5 | 170 | 162 | ✓ |
| | 160.5 | 165 | 168 | 168 | | |
| | 162 | 165 | 169 | 168 | | |

charged at special rates. See note on page 1.

| | 6 | 7 | 8 | 9 | | |
|---|---|---|---|---|---|---|
| | 4/26 | 4/26 | 4/27 | 4/27 | 162 | ✓ |
| | 163.7 | 163.5 | 165 | 165 | | |

(on the first 3 runs, – see note on page 1.

Output to 1V and to .5V on 15-hr. charge:

| Run | 513 | 514 | 515 | 516 |
|---|---|---|---|---|
| Date | 4/25/10 | 4/26 | 4/27 | 4/28 |
| A4 # 488 | 165 – 196.5 | 164 – 195 | 161.5 – 191 | 165 – 192 |

| Run | 454 | 455 | 456 | 457 |
|---|---|---|---|---|
| Date | 4/25/10 | 4/26 | 4/27 | 4/28 |
| A4 # 551 | 195 – 232 | 193.5 – 228.5 | 193 – 225 | 195 – 225 |
| " # 568 | 190 – 221.7 | 192.5 – 220 | 191 – 220 | 190 – 216.5 |

Note: Cells # 551 + 568 were refilled with KOH + 52.5 g. SiO2 per cell, (105 g. per A4). A cell

| Run | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Date | 4/27/10 | 4/28 | 4/30 | 5/2 |
| B4 # 6 | 70 – 83.2 | 66.5 – 94.5 | 70 – 91.7 | 70 – 90 |
| " 7 | 70.5 – 93.2 | 67.5 – 96.2 | 70 – 92.1 | 70 – 92.5 |
| " 8 | 81 – 89.3 | 95 – 103 | 92.2 – 94 | 91.1 – 94.7 |
| " 9 | 81 – 89.6 | 95 – 103.7 | 92.5 – 97.5 | 92.5 – 97.9 |

N.B. – These cells are charged at special rates. These are cells of the new, ignition type, each also contains 5 Fe plates, but these differ in that one row of 8 regular ½" x 3" pockets, each Fe plate consists of 16 ¾"-length (½" x 2¼") pockets. Set numbers: – Ni(OH)2 # 1194; KOH + 52.5 g. SiO2 per cell, (105 g. per A4). A cell



Output to 1V. on 7-hr. charge:

| 517 | 518 * | 519 * | 520 | 521 | 522 |
|---|---|---|---|---|---|
| 4/29 | 4/29 | 4/30 | 5/2 | 5/2 | 5/3 |
| 145 | 143.5 – 171 | 141 – 166.2 | 142.5 | 140 | 145 |

* Discharged to .50V by mistake on runs # 518 + 519.

| 458 | 459 * | 460 * | 461 | 462 | 463 |
|---|---|---|---|---|---|
| 4/29 | 4/29 | 4/30 | 5/2 | 5/2 | 5/3 |
| 150.7 | 163 – 193 | 152.2 – 178.5 | 153.5 | 158 | 165 |
| 154 | 160 – 183.2 | 152.7 – 176 | 151.7 | 157 | 160.7 |

21 % KOH + 11.2 g. SiO2 per l., after run # 453.
* Discharged to .50V by mistake on runs # 459 + 460.

| 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|
| 5/3 | 5/4 | 5/4 | 5/5 | 5/5 |
| 72.2 – 96.3 | 67.4 | 70 | 69.3 | 68.7 |
| 73 – 94.7 | 67.4 | 70 | 69.4 | 68.7 |
| 92.5 – 94.7 | 80.4 | 83.2 | 84.1 | 84.7 |
| 93.7 – 98.7 | 80.2 | 82.5 | 84.1 | 84.7 |

on the first 3 runs; see note on page 1.
Each contains 4 Ni plates of 15 reg. tubes each; differ, as follows: in cells # 6 + 7 each Fe plate contains, averaging 7.866 g. of Fe Mix per pocket; in cells # 8 + 9 pockets in two rows, averaging 5.670 g. of Fe Mix. Flake # 537; Fe Mix # 1316. Electrolyte: 21 % KOH. holds 850 cc of electrolyte, – 21.4 % more per tube than A4.

Output to 1V and .5V on 15-ln. charge:

| Run | 289 | 290 | 291 | | |
|---|---|---|---|---|---|
| Date | 4/27/10 | 4/28 | 4/29 | | |
| A4 #2752 | 182 - 189 | 179.5 - 187 | 177.5 - 185.5 | | |
| " 2753 | 185 - 190.7 | 180 - 187.7 | 177.5 - 185.7 | | |
| " 2754 | 193.7 - 206.7 | 192 - 205.2 | 190.7 - 203.2 | | |

| Run | 31 | 32 | 33 | 34 | |
|---|---|---|---|---|---|
| Date | 4/29/10 | 4/30 | 5/2 | 5/3 | |
| A8 #267 | 379.5 - 422.5 | 400 - 441.5 | 410 - 444 | 398.5 - 424 | |
| " 270 | 383.5 - 428.5 | 405 - 445.5 | 413 - 446 | 405 - 433 | |

| Run | 337 | 338 | 339 | 340 | |
|---|---|---|---|---|---|
| Date | 4/30/10 | 5/2 | 5/3 | 5/4 | |
| A4 #2314 | 173.2 - 201 | 182.5 - 205 | 181.5 - 205 | 183.5 - 207.7 | |
| " 2315 | 181 - 209.5 | 190 - 215 | 189.2 - 210 | 188.5 - 211.7 | |
| " 2316 | 183 - 204.5 | 190 - 211 | 184.2 - 201.5 | 188.7 - 207 | |

| Run | 118 | 119 | 120 | | |
|---|---|---|---|---|---|
| Date | 4/30/10 | 5/2 | 5/3 | | |
| A4 #10485 | 185 - 195.7 | 191.5 - 202.5 | 191 - 202.5 | | |
| " 10486 | 186 - 199.7 | 192.5 - 206 | 193 - 206.5 | | |



Output to 1V on 7-ln. charge:

| | 292 | 293 | 294 | 295 | |
|---|---|---|---|---|---|
| | 4/29 | 4/30 | 5/2 | 5/2 | 169 ✓ |
| | 146 | 150.7 | 152.5 | 150.5 | |
| | 146.2 | 151.7 | 153.5 | 151.7 | |
| | 156.2 | 162.5 | 164.2 | 160.7 | |

| | 35 | 36 | 37 | 38 | |
|---|---|---|---|---|---|
| | 5/4 | 5/4 | 5/5 | 5/5 | 169 (not entered) |
| | 317 | 347 | 337.5 | 337 | |
| | 323.5 | 354 | 340 | 340 | |

| | 341 | 342 | 343 | 344 | |
|---|---|---|---|---|---|
| | 5/4 | 5/5 | 5/6 | 5/6 | 169 ✓ |
| | 150 | 160 | 163 | 159 | |
| | 153.2 | 164.5 | 167 | 163.5 | |
| | 154 | 163.2 | 164.2 | 162 | |

| | 121 | 122 | 123 | 124 | |
|---|---|---|---|---|---|
| | 5/4 | 5/4 | 5/5 | 5/5 | 169 ✓ |
| | 156 | 164 | 165 | 163.5 | |
| | 157.2 | 165 | 168.5 | 165 | |

Output to 1V and .5V on overcharge:

| Run | 118 | 119 | 120 | | |
|---|---|---|---|---|---|
| Date | 4/30/10 | 5/2 | 5/3 | | |
| A4#10487 | 180 - 194.5 | 188.2 - 199 | 187 - 200.5 | | |

| Run | 221 * | 222 | 223 | | |
|---|---|---|---|---|---|
| Date | 4/30/10 | 5/2 | 5/3 | | |
| A4#4711 | 170.5 — | 175 - 186 | 173.5 - 185 | | |
| " 4712 | 169.7 — | 173.5 - 189.5 | 174.7 - 192.5 | | |
| " 4713 | 174 — | 178.5 - 200.5 | 180 - 202 | | |

* Discharg'd to 1V only, by mistake, on run #221.

| Run | 18 | 19 | 20 | 21 | |
|---|---|---|---|---|---|
| Date | 5/5/10 | 5/6 | 5/7 | 5/9 | |
| A4#1559 3 | 202.2 - 209.5 | 200.2 - 209 | 199.5 - 206.7 | 212.5 - 220.5 | |
| " 1559 4 | 200 - 208.2 | 199 - 206 | 197.7 - 205 | 211.5 - 219.7 | |
| " 1559 5 | 201.7 - 208.7 | 200 - 206.5 | 197.7 - 204.5 | 212.5 - 220 | |

| Run | 222 | 223 | 224 | 225 | |
|---|---|---|---|---|---|
| Date | 5/5 | 5/6 | 5/7 | 5/9 | |
| A4#54 | 169.2 - 183.5 | 170.5 - 183.2 | 167 - 181.5 | 169.7 - 185 | |



Output to 1V on 7-hr. charge:

| Run | 121 | 122 | 123 | 124 |
|---|---|---|---|---|
| Date | 5/4 | 5/4 | 5/5 | 5/5 |
| A4#10487 | 155 | 162.5 | 164.5 | 160 |

| Run | 224 | 225 | 226 | 227 |
|---|---|---|---|---|
| Date | 5/4 | 5/4 | 5/5 | 5/5 |
| A4#4711 | 150.5 | 153 | 154.2 | 155 |
| " 4712 | 151.5 | 154 | 157.2 | 157 |
| " 4713 | 152 | 159.5 | 160 | 160 |

| Run | 22 | 23 | 24 | 25 |
|---|---|---|---|---|
| Date | 5/10 | 5/10 | 5/11 | 5/11 |
| A4#1559 3 | 168.2 | 176.5 | 179 | 181.2 |
| " 1559 4 | 167 | 175 | 177.5 | 181 |
| " 1559 5 | 168.2 | 175 | 179 | 180 |

| Run | 226 | 227 | 228 | 229 |
|---|---|---|---|---|
| Date | 5/10 | 5/10 | 5/11 | 5/11 |
| A4#54 | 143 | 150 | 150 | 153 |

Output to 1V and .5V on overcharge.

| | | | |
|---|---|---|---|
| Run | 343 | 344 | 345 |
| Date | 5/5 | 5/6 | 5/9 |
| A4#2317 | 163.5 - 186.7 | 166.7 - 187.5 | 163 - 185 |
| Run | 18 | 19 | 20 |
| Date | 5/5 | 5/6 | 5/9 |
| A4#55 | 187 - 192 | 188.5 - 196 | 193.5 - 199.5 |
| Run | 582 | 583 | 584 |
| Date | 5/6 | 5/7 | 5/9 |
| A4#478 | 178.7 - 217.5 | 181.5 - 215.5 | 190 - 219 |
| " 479 | 170 - 202.5 | 169.5 - 200.2 | 174.5 - 205 |
| " 480 | 171.7 - 195.5 | 169.7 - 194 | 173.5 - 197.2 |
| Run | 282 | 283 | 284 |
| Date | 5/6 | 5/7 | 5/9 |
| A4#3011 | 183.2 - 198.7 | 184 - 200 | 187.5 - 204.2 |
| " 3012 | 182.5 - 199 | 182.7 - 199.5 | 187 - 204.2 |
| " 3013 | 182.5 - 202.5 | 184 - 204 | 187.5 - 207.7 |



Output to 1V on 7-hr. charge.

| | | | | | |
|---|---|---|---|---|---|
| 346 | 347 | 348 | 349 | 350 | TEG |
| 5/10 | 5/10 | 5/11 | 5/11 | 5/12 | |
| 138 | 143.2 | 142 | 142.7 | 142.5 | |
| 21 | 22 | 23 | 24 | 25 | TEG |
| 5/10 | 5/10 | 5/11 | 5/11 | 5/12 | |
| 165 | 166.5 | 167.2 | 168 | 165.7 | |
| 585 | 586 | 587 | 588 | 589 | TEG |
| 5/10 | 5/10 | 5/11 | 5/11 | 5/12 | |
| 160 | 162.5 | 161.5 | 160 | 163.5 | |
| 148 | 152.5 | 150 | 152.5 | 154 | |
| 148 | 152.5 | 150 | 151.7 | 154 | |
| 285 | 286 | 287 | 288 | | TEG |
| 5/10/10 | 5/10 | 5/11 | 5/11 | | |
| 152.5 | 157.5 | 158.5 | 162 | | |
| 152.5 | 157 | 158 | 161.5 | | |
| 152.5 | 157.5 | 159.2 | 163.5 | | |

Output to 1V and .5V on overcharge.

| Run | 229 | 230 | 231 |
|---|---|---|---|
| Date | 5/7/10 | 5/9 | 5/10 |
| A4 #4711 | 180 - 190.7 | 183.5 - 195 | 182 - 193 |
| " 4712 | 183 - 199 | 187.5 - 203.2 | 187 - 201.2 |
| " 4713 | 186 - 208 | 191.5 - 213 | 190 - 209.5 |

Note: Cells #4711-13 were refilled with 21% KOH + 11.2 g. SiOH per l. after run #228.

| Run | 230 | 231 | Unusual rdn. Can be seen | 232 | 233 | 234 |
|---|---|---|---|---|---|---|
| Date | 5/13 | 5/14 | | 5/16 | 5/17 | 5/18 |
| A4 #54 | 169.2 - 185 | 169.7 - 185 | Off | 183.5 - 200 | 182 - 197.7 | 182.5 - 198.5 |

Note: Cell was refilled with 21% KOH + 11.2 g. SiOH per l. after run #229; also after #231.

| Run | 4 | 5 |
|---|---|---|
| Date | 5/12/10 | 5/13 |
| A4 #15327 | 185 - 188.5 | 183.7 - 188.2 |
| " 15328 | 182 - 186 | 183 - 188.2 |
| " 15331 | 181.2 - 185 | 180 - 184.2 |
| " 15334 | 180 - 183.7 | 179 - 183.7 |

These are regular cells from stock, high discharge rates, etc., when fully formed at factory and then stood (discharged) at Lab. (Run #4). All 4 cells contain $Ni(OH)_2$ #1166 + 1168; Fe Mix #1283.



Output to 1V on 7-hr. charge.

| 232 | 233 | 234 | 235 | 236 |
|---|---|---|---|---|
| 5/11 | 5/11 | 5/12 | 5/12 | 5/13 |
| 154.2 | 160.7 | 161 | 161.5 | 159 |
| 155.5 | 161.7 | 163.7 | 164 | 162.5 |
| 156.7 | 167.5 | 166.2 | 166.7 | 166.2 |

KOH + 11.2 g. SiOH per l. after run #228.

Wires Elec. Electrolyte Removed

| 235 | 236 | 237 | 238 | 239 |
|---|---|---|---|---|
| 5/18 | 5/19 | 5/20 | 5/20 | 5/21 |
| 153 | 161.5 | 158.2 | 161.7 | 158.5 |

| 6 | 7 | 8 | 9 |
|---|---|---|---|
| 5/13 | 5/14 | 5/16 | 5/16 |
| 161.5 | 164 | 165.2 | 166.5 |
| 162 | 165 | 166 | 165.7 |
| 161.7 | 163.5 | 164.5 | 165 |
| 161 | 163.5 | 164 | 165 |

which will be used for special tests at high discharge rates, etc., when fully formed. Cells had the regular 3 first runs in stock for 6 weeks before the first run, the same active materials, viz. - Ni Flake #5.33 Reg. Electrolyte :- 21% KOH + 8.7 g. SiOH per A4.

Output to 1V and .5V on overcharge.

| Run | 120 | 121 | 122 | | |
|---|---|---|---|---|---|
| Date | 5/13/10 | 5/14 | 5/16 | | |
| A4 #10794 | 164.5 - 166.7 | 163.5 - 167.5 | 167.5 - 171.5 | | |
| " 10795 | 166 - 167.7 | 166.2 - 170 | 170 - 174 | | |
| " 10796 | 175 - 178.7 | 175.5 - 179.5 | 179 - 183.5 | | |
| " 10797 | 180.5 - 185 | 179 - 184 | 184 - 189.5 | | |
| " 10798 | 185 - 190.5 | 184.2 - 190.2 | 189.5 - 195 | | |
| " 10799 | 185 - 190.2 | 186.5 - 192 | 189.5 - 194 | | |
| " 10800 | 188 - 196.5 | 188.7 - 196.7 | 190 - 196.2 | | |
| " 10801 | 186.5 - 194 | 188.7 - 196.5 | 190 - 196.2 | | |
| " 10802 | 187.5 - 196.5 | 192 - 200.7 | 192.5 - 202.5 | | |
| " 10803 | 190 - 200 | 193 - 203.7 | 194.2 - 206.5 | | |

| Run | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Date | 5/14/10 | 5/16 | 5/18 | 5/19 | 5/20 |
| A4 #15646 | 209 - 231.5 | 203.2 - 228 | 214 - 238 | 203.5 - 225.5 | 215 - 233.5 |

N.B. - New cells are charged at special rates on the first 3 runs; see note page 1.
This is special cell containing 16.8 % of Bi in the $Ni(OH)_2$. Active materials are:
#734 $Ni(OH)_2$ + 16.8 % Bi ; #540 Ni = Ni lake ; #1329 = Ni mix. Electrolyte:
21 % KOH + 87 g. LiOH per A4. Loading is regular ; average loading
weights are - .029 g. Hydrate , .004 g. Ni lake. Average weight of
$Ni(OH)_2$ + Bi = 9.628 g per tube.



Output to 1V on 7-hr. charge.

| 123 | 124 | 125 | 126 |
|---|---|---|---|
| 5/17 | 5/17 | 5/18 | 5/18 |
| 145 | 146.7 | 147.5 | 145.7 |
| 146.5 | 147.7 | 148 | 150 |
| 153.5 | 156 | 155 | 156.5 |
| 155.7 | 159 | 160 | 160 |
| 158.7 | 162.5 | 163.2 | 165 |
| 157 | 161.5 | 160 | 163.7 |
| 155 | 162.5 | 164.5 | 166 |
| 154 | 162 | 163 | 165 |
| 158.5 | 166.5 | 166.5 | 168.2 |
| 158.5 | 167 | 167.5 | 169 |

| 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|
| 5/20 | 5/21 | 5/23 | 5/24 | 5/24 |
| 158 | 167.5 | 156.5 | 159 | 162 |

Output to 1V and .5V on overcharge.

| Run | 361 | 362 | 363 | | |
|---|---|---|---|---|---|
| Date | 5/17/10 | 5/18 | 5/19 | | |
| A4* 2310 | 182.5 - 202 | 181.2 - 201.7 | 182.5 - 203 | | |
| " 2311 | 183.2 - 202 | 184 - 201 | 184.5 - 202 | | |
| " 2312 | 186.2 - 217.5 | 187 - 215 | 191.5 - 215.2 | | |
| " 2313 | 185.2 - 231.7 | 190.5 - 232 | 196 - 235 | | |

| Run | 282 | 283 | 284 | 285 | |
|---|---|---|---|---|---|
| Date | 5/18/10 | 5/19 | 5/20 | 5/21 | |
| A4# 3784 | 177 - 181.5 | 177.7 - 182.5 | 171.7 - 175.5 | 169 - 174 | |
| " 3785 | 184.5 - 189.5 | 183.5 - 189.2 | 180 - 184.2 | 179.2 - 185 | |
| " 3786 | 192 - 201.5 | 191.5 - 202 | 191.5 - 201 | 193 - 203.2 | |

| Run | 392 | 393 | 394 | 395 | |
|---|---|---|---|---|---|
| Date | 5/18/10 | 5/19 | 5/20 | 5/21 | |
| A4* 1575 | 182.7 - 205 | 178 - 198 | 180 - 198.5 | 181.2 - 198.5 | |

| Run | 34 | 35 | 36 | | |
|---|---|---|---|---|---|
| Date | 5/19 | 5/20 | 5/21 | | |
| A4 *55 | 192.7 - 200 | 193.2 - 200.7 | 196.7 - 204.2 | | |



Output to 1V on 7-hr. charge.

| | 364 | 365 | 366 | 367 | 368 |
|---|---|---|---|---|---|
| | 5/19 | 5/20 | 5/21 | 5/23 | 5/23 |
| | 147.5 | 160.5 | 158 | 156.5 | 161 |
| | 143.2 | 156 | 154.5 | 150 | 157 |
| | 148.5 | 166.7 | 164 | 165 | 165 |
| | 146.2 | 174.7 | 170.5 | 172.5 | 175 |

| | 286 | 287 | 288 | 289 |
|---|---|---|---|---|
| | 5/23 | 5/23 | 5/24 | 5/24 |
| | 145 | 149.5 | 144 | 144 |
| | 155 | 157.5 | 155 | 154 |
| | 158.7 | 166 | 164.5 | 163.7 |

| | 396 | 397 | 398 | 399 |
|---|---|---|---|---|
| | 5/23 | 5/23 | 5/24 | 5/24 |
| | 153 | 159 | 156 | 155 |

| | 37 | 38 | 39 | 40 |
|---|---|---|---|---|
| | 5/23 | 5/23 | 5/24 | 5/24 |
| | Bad run | 172.5 | 169 | 170 |

Output to 1V and .5V on overcharge

| Run | 34 | 35 | 36 | | |
|---|---|---|---|---|---|
| Date | 5/19/10 | 5/20 | 5/21 | | |
| A4 #15593 | 202.7 - 213 | 200.7 - 208.7 | 203.5 - 212.2 | | |
| " 15594 | 204.2 - 215.5 | 200.7 - 209 | 203.5 - 213 | | |
| " 15595 | 204.5 - 215 | 203 - 210.7 | 206 - 214.2 | | |

| Run | 1 | 2 | 3 | 4 | |
|---|---|---|---|---|---|
| Date | 5/21 | 5/23 | 5/25 | 5/26 | |
| A4 #15647 | 203 - 210 | 185 - 190 | 176.5 - 181.5 | 175 - 180.5 | |
| " 15648 | 202 - 205.5 | 180 - 194 | 169 - 171 | 163.5 - 165 | |
| " 15649 | 208.2 - 213.7 | 191.2 - 196.5 | 179.7 - 184.5 | 174.5 - 177 | |
| " 15650 | 211.5 - 218.5 | 194 - 200.2 | 182.5 - 188.7 | 178.5 - 183 | |
| " 15651 | 215 - 220.2 | 185 - 195 | 188 - 193.2 | 177 - 180 | |
| " 15652 | 214 - 223.2 | 190 - 202 | 191.7 - 199 | 185 - 190 | |
| " 15653 | 216.7 - 227.5 | 195 - 210 | 196.2 - 205 | 193 - 199.5 | |

These are new regular cells having special electrolytes, as follows:

| | | | | |
|---|---|---|---|---|
| #15647 | 21% KOH + 90 g. SiOH per A4 cell, (reg.). | | | |
| 15648 | 24% KOH + 50 g. SiOH per A4 cell. | | | |
| 15649 | " " 70 g. " " " | | | |
| 15650 | " " 90 g. " " " | | | |
| 15651 | 27% KOH + 50 g. SiOH per A4 cell | | | |
| 15652 | " " 70 g. " " " | | | |
| 15653 | " " 90 g. " " " | | | |



Output to 1V on 7-hr. charge

| | 37 | 38 | 39 | 40 | | |
|---|---|---|---|---|---|---|
| | 5/23 | 5/23 | 5/24 | 5/24 | | |
| Run Spoiled | | 176.5 | 172.5 | 171.5 | ✓ | ✓ |
| | | 175 | 172.5 | 172.5 | | |
| | | 175 | 173.5 | 173.2 | | |

| | 5 | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|---|
| | 5/26 | 5/27 | 5/27 | 5/28 | 5/31 | 5/31 | |
| | 162.5 | 162 | 155 | 172.2 | 169.2 | 170 | |
| | 147 | 142.5 | 148.5 | 150 | 151 | 154.5 | |
| | 155 | 154.7 | 160 | 163.7 | 163 | 165 | ✓ |
| | 160.5 | 160.5 | 165.7 | 170 | 169.2 | 171 | ✓ |
| | 150 | 143.5 | 150 | 153 | 152.5 | 151.5 | |
| | 155 | 155 | 160.5 | 165 | 167.5 | 165 | |
| | 159.5 | 163 | 167.5 | 173.5 | 175 | 175 | |

All contain the same active materials, which are: $Ni(OH)_2$ #1260
Ni Flake #42
Fe Mix #1338

Loading weights:
$Ni(OH)_2$ - .0286 g. per chamber
Flake - .0044 g. " "

Output to 1V and .5V on Overcharge.

| Run | 19 | 20 | 21 | 22 |
|---|---|---|---|---|
| Date | 5/24 | 5/25 | 5/26 | 5/27 |
| A4# 15327 | 202.5 - 207.5 | 186 - 191.7 | 190 - 196 | 191.2 - 197.5 |
| 15328 | 200 - 205.2 | 186.5 - 191.5 | 190 - 196.5 | 191.2 - 197.7 |
| 15331 | 200 - 205.2 | 185 - 191 | 189.5 - 195 | 190 - 196.5 |
| 15334 | 196.5 - 203 | 184.5 - 190 | 190.5 - 196.2 | 190 - 195 |
| Run | 633 | 634 | 635 | |
| Date | 5/25 | 5/26 | 5/27 | |
| A4# 398 | 160.5 - 180.2 | 157.7 - 176.7 | 153.5 - 173.5 | |
| Run | 583 | 584 | 585 | |
| Date | 5/25 | 5/26 | 5/27 | |
| A4# 404 | 165 - 186.7 | 164 - 188.2 | 165.2 - 187 | |
| Run | 608 | 609 | 610 | |
| Date | 5/25 | 5/26 | 5/27 | |
| A4# 466 | 175 - 189.2 | 174.2 - 190.5 | 173.5 - 191.5 | |
| " 467 | 183.7 - 208.2 | 185 - 206 | 183 - 206.5 | |
| " 468 | 195 - 220.5 | 194.5 - 217.5 | 193.2 - 218.5 | |



Output to 1V on 7-hr. charge.

| | 23 | 24 | 25 | 26 | 27 |
|---|---|---|---|---|---|
| | 5/27 | 5/28 | 5/31 | 5/31 | 6/1 |
| | 166.2 | 173.7 | 172 | 171 | 170 |
| | 166.5 | 173.7 | 172.2 | 172 | 170 |
| | 165.7 | 172.5 | 171 | 170 | 169 |
| | 164 | 169.7 | 170 | 169.2 | 168 |
| | 636 | 637 | 638 | 639 | 640 |
| | 5/28 | 5/31 | 5/31 | 6/1 | 6/1 |
| | 135.7 | 140 | 135 | 137.5 | 135.7 |
| | 586 | 587 | 588 | 589 | 590 |
| | 5/28 | 5/31 | 5/31 | 6/1 | 6/1 |
| | 135 | 140 | 139 | 139 | 138.5 |
| | 611 | 612 | 613 | 614 | |
| | 5/28 | 5/31 | 5/31 | 6/1 | |
| | 144.5 | 151.5 | 151.7 | 152 | |
| | 146.5 | 157.7 | 156.5 | 156.7 | |
| | 151.2 | 165 | 162.5 | 164 | |

Note: A circle around the run number means that run was made after charging and in which to be kept on account of charging point of charging, W.E.H.

Output to 1V and .5V on Overcharge.

| Run | 370 | 371 | 372 | | |
|---|---|---|---|---|---|
| Date | 5/25/10 | 5/26 | 5/27 | | |
| A4 #2310 | 178-202.5 | 180-202 | 180-204.5 | | |
| " 2311 | 187.2-207.2 | 188.5-204.2 | 189-206.5 | | |
| " 2312 | 194.2-221 | 193-210.5 | 194.5-219.5 | | |
| " 2313 | 196.5-236.5 | 196-230 | 195.5-233.2 | | |

Note: New solution was put in 3 of these cells after the 369th run, as follows:-

| | | | |
|---|---|---|---|
| #2311 | Renewed | with 21 o/o KOH | straight, (no SiOH). |
| #2312 | " | " " | + 11.2 g. SiOH per liter. |
| #2313 | " | " " | + 22.5 g. " " " |

| Run | 339 | 340 | 341 | 342 | 343 |
|---|---|---|---|---|---|
| Date | 6/2/10 | 6/3 | 6/4 | 6/6 | 6/7 |
| A4 #643 | 180-214 | 189.7-207.7 | 192-207.5 | 195.5-212 | 192-205 |

This cell (#643) and cell #B1, below, are temperature tests until their cans were removed from the nested cans solution. After soaking several new cans and filled with fresh then tested regularly with the

| Run | 357 | 358 | 359 | 360 | 361 |
|---|---|---|---|---|---|
| Date | 6/2/10 | 6/3 | 6/4 | 6/6 | 6/7 |
| A4 #B1 | 180-204 | 189.7-205 | 192-206.5 | 198-215 | 194-210.5 |



Output to 1V on 7-hr. charge.

| | | | | |
|---|---|---|---|---|
| 373 | 374 | 375 | 376 | |
| 5/28 | 5/31 | 5/31 | 6/1 | |
| 150.5 | 159 | 155 | 156.5 | |
| 150 | 156 | 156 | 155 | |
| 157.2 | 168.7 | 166.7 | 166 | |
| 159.5 | 174.2 | 176.5 | 172 | |

| | | | | |
|---|---|---|---|---|
| 344 | 345 | 346 | 347 | |
| 6/8 | 6/8 | 6/9 | 6/9 | |
| 159.7 | 165.2 | 168.5 | 168 | |

the cells which were used for the special nested tests. After that the assembled plates and soaked in jars of 21 o/o KOH + 11.2 g SiOH meeks the plates were reassembled in 21 o/o KOH + 11.2 g. SiOH per l. Cells were result here given.

| | | | | |
|---|---|---|---|---|
| 362 | 363 | 364 | 365 | |
| 6/8 | 6/8 | 6/9 | 6/9 | |
| 153.5 | 159.5 | 160.5 | 160 | |

Output to 1V and .5V on Overcharge.

| Run | 574 | 575 | 576 | 577 | 578 |
|---|---|---|---|---|---|
| Date | 6/2/10 | 6/3 | 6/4 | 6/6 | 6/7 |
| A4 #482 | 171 - 225.5 | 174.7 - 219.5 | 180 - 218.5 | 185 - 222.5 | 181 - |

| Run | 4 | 5 | 14 | 15 |
|---|---|---|---|---|
| Date | 6/2/10 | 6/3 | 6/9 | 6/10 |
| A6 #12361 | 271.8 - 279 | 265.8 - 273.7 | 268.1 - 276.7 | 280.7 - 290.7 |
| 12454 | 279 - 285.7 | 272.6 - 279.7 | 269.2 - 278.2 | 281.9 - 291.9 |
| 12498 | 276 - 283.1 | 270 - 276.7 | 267.7 - 275.2 | 281.9 - 291.1 |
| 12570 | 279.7 - 286.5 | 272.6 - 279 | 268.8 - 276 | 284.2 - 292.6 |
| 12579 | 280.5 - 288.6 | 274.8 - 283.1 | 273 - 282.3 | 287.6 - 298.4 |
| 12585 | 275.2 - 279.7 | 267.3 - 273.7 | 268.8 - 276.3 | 276.9 - 285 |
| 12639 | 278.2 - 282.7 | 268.5 - 274.8 | 268.8 - 277.1 | 278.8 - 287.6 |
| 12640 | 271.1 - 276 | 266.2 - 272.2 | 266.2 - 271.5 | 276.5 - 282.6 |
| 12840 | 269.2 - 276 | 262.1 - 271.5 | 266.2 - 285 | 276.9 - 289.6 |
| 12997 | 268.5 - 274.8 | 267.3 - 276.3 | 268.8 - 285 | 278.4 - 288.4 |
| 13004 | 268.5 - 276 | 261.7 - 268.1 | 273.7 - 283.1 | 283 - 293.4 |
| 13048 | 268.1 - 276 | 258.7 - 264.7 | 266.2 - 252 | 277.3 - 285.7 |
| 13134 | 259.1 - 268.5 | 253.5 - 259.8 | 258 - 267.7 | 277.3 - 287.3 |
| 13178 | 261.7 - 268.8 | 255 - 262.5 | 266.2 - 276.7 | 276.9 - 286.9 |
| 13271 | 263.2 - 270.7 | 259.5 - 265.8 | 273 - 282.7 | 280.7 - 290.7 |

Cells were put through charging 7 hrs. @ 45 amps and discharging at 30 amps to 1V and a 1 hour of the technique of putting up the full capacity of the cells such runs, then run on overcharge again.

These are regular "A6" cells of about average capacity from stock. Cells will be brought up to good capacity and then shipt to the N.Y. Edison Co. for tests.



Output to 1V on 7-hr. charge.

| Run | 579 | 580 | 581 | 582 |
|---|---|---|---|---|
| Date | 6/8 | 6/8 | 6/9 | 6/9 |
| A4 #482 | 143.5 | 159.5 | 160 | 160 |

| Run | 16 | 17 |
|---|---|---|
| Date | 6/13 | 6/14 |
| A6 #12361 | 293.2 - 305.2 | 283.5 - 292.5 |
| 12454 | 294.7 - 306.7 | 283.5 - 292.5 |
| 12498 | 296.6 - 307.1 | 286.1 - 293.2 |
| 12570 | 298.1 - 307.5 | 286.1 - 293.2 |
| 12579 | 299.2 - 311.2 | 289.5 - 300.7 |
| 12585 | 292.5 - 300.7 | 275.2 - 285 |
| 12639 | 297 - 307.5 | 280.8 - 288.3 |
| 12640 | 291.7 - 300 | 277.5 - 285 |
| 12840 | 291 - 306 | 278.6 - 291 |
| 12997 | 291.7 - 302.6 | 280.5 - 290.2 |
| 13004 | 294.7 - 307.5 | 279.7 - 291.7 |
| 13048 | 288.7 - 302.2 | 275.2 - 284.2 |
| 13134 | 288.7 - 302.6 | 270 - 283.5 |
| 13178 | 288 - 302.2 | 274.5 - 283.5 |
| 13271 | 294 - 306.3 | 279.7 - 290.2 |

Twelve of these were shipt to Mr. Torchio of N.Y. Edison Co. on 6/15/10.

Three were kept for comparative tests here at the Laboratory. The cells kept were #13134, 13178, and 13271.

No entry

## Output to 1.V. & .5V on Overcharge

## Output to 1.V. on 7 Hour Charge

| Run | 1 | 2 | 3 | 4 | | 5 | 6 | 7 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Date | 6/3/10 | 6/7 | 6/8 | 6/9 | | 6/10 | 6/10 | 6/11 | ✓ | ✓ |
| A4 #15655 | 205 - 220 | 185 - 198.7 | 164.7 - 183.7 | 184.7 - 199 | | 156 | 167.2 | 170 | | |

Special cell from R.g. Smith; containing Tubes loaded in a machine having a flat stiner.

Active Materials: Ni(OH)$_2$ #1270; Ni Flake #32 X (Special flat); Fe Mix #1338

Electrolyte: 210 c.c. KOH + 90 g. LiOH per A4

Loading Weights: Ni(OH)$_2$ .027 g.; Ni Flake .0039 g.; Fe Mix .410 g.

Average Weights: Ni Mix 10.217 g. per tube; Fe Mix 7.700 g. per pocket

| Run | 283 | 284 | 285 | | | 286 | 287 | 288 | 289 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 6/8 | 6/9 | 6/10 | | | 6/10 | 6/13 | 6/14 | 6/14 | 104 | Will set aside these two on account of overcoming of ments. W.E.H. |
| A4 #3408 | 163.2 - 171 | 151.2 - 163.5 | 165 - 175.7 | | | 125.5 | 124.2 | 124.5 | 128.5 | ✓ | |
| " #3549 | 177.5 - 190 | 173 - 187.5 | 174.7 - 190.7 | | | 145 | 149.2 | 146 | 150.5 | | |

| Run | 49 | 50 | 51 | | | 52 | 53 | 54 | 55 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 6/8 | 6/9 | 6/10 | | | 6/10 | 6/13 | 6/14 | 6/14 | ✓ | ✓ |
| A4 #55 | 202.5 - 211.7 | 198.5 - 206.7 | 196.7 - 206.2 | | | 165 | 175.7 | 172.5 | 171 | | |

See previous result on page 16 which has not been market O.K.

| Run | 19 | 20 | 21 | | | 22 | 23 | 24 | 25 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 6/11/10 | 6/13 | 6/14 | | | 6-15 | 6-16 | 6/16 | 6/17 | ✓ | ✓ |
| A4 #15646 | 194.2 - 205.5 | 196.5 - 203 | 197.5 - 203.5 | | | 162 | 160.2 | 160 | 158 | | |

See first runs and details of make-up of #15646 on page 14, this book.

## Output to I.V. & .5V. on Overcharge

| | | | | | |
|---|---|---|---|---|---|
| Run | 566 | 567 | 568 | | |
| Date | 6/11 | 6/13 | 6/14 | | |
| A4# 488 | 163.7 - 193 | 166.5 - 192.2 | 164.2 - 188.7 | | |
| Run | 507 | 508 | 509 | | |
| Date | 6/11 | 6/13 | 6/14 | | |
| A4# 551 | 181.5 - 233.7 | 191.5 - 231 | 194 - 221.2 | | |
| " 568 | 186 - 219.2 | 191.7 - 220.5 | 192 - 215.5 | | |
| Run | 393 | 394 | 395 | | |
| Date | 6/13 | 6/14 | 6-15 | | |
| A4# 2314 | 175 - 200 | 171.2 - 198 | 168.2 - 191.7 | | |
| " 2315 | 179.2 - 205 | 174.5 - 203 | 172.7 - 196 | | |
| " 2316 | 179.2 - 203.7 | 175 - 199.5 | 172.5 - 195 | | |
| Run | 344 | 345 | 346 | | |
| Date | 6/14/10 | 6-15 | 6-16 | | |
| A4# 2752 | 187 - 192.5 | 178 - 186.5 | 167 - 175 | | |
| " 2753 | 188.5 - 197.5 | 181.5 - 189.5 | 172 - 181 | | |
| " 2754 | 199 - 215 | 192 - 208 | 189.7 - 205 | | |



## Output to I.V. on 7 Hour Charge

| | | | | | |
|---|---|---|---|---|---|
| | 569 | 570 | 571 | 572 | |
| | 6-15 | 6-16 | 6/16 | 6/17 | |
| | 142.5 | 142.5 | 141.5 | 142.2 | |
| | 510 | 511 | 512 | 513 | |
| | 6-15 | 6-16 | 6/16 | 6/17 | |
| | 153 | 160 | 160 | 161 | |
| | 157.5 | 158 | 157 | 158 | |
| | 396 | 397 | 398 | 399 | |
| | 6/16 | 6/16 | 6/17 | 6/18 | |
| | 143 | 148.5 | 147.5 | 145 | |
| | 148.5 | 152 | 151 | 149 | |
| | 145 | 151.7 | 150 | 148 | |
| | 347 | 348 | 349 | 350 | |
| | 6/16 | 6/16 | 6/17 | 6/18 | |
| | 147.7 | 149 | 147 | 147 | |
| | 147 | 150 | 150 | 152.5 | |
| | 153 | 162.5 | 160 | 162.5 | |

Solution was changed after the 453 [illegible] 21/9 + 112 [illegible]

Colum was Dolcet. on charge or does it run 50 min?

## Output to I.V. & .5V on Overcharge

| Item | 171 | 172 | 173 | | |
|---|---|---|---|---|---|
| Date | 6-15 | 6/16 | 6/17 | | |
| At 10485 | 191.7-200 | 188 - 198.5 | 191.5 - 202 | | |
| " 10486 | 191 - 201.5 | 188 - 200.7 | 193.0 - 205 | | |
| " 10487 | 187.5 - 197.5 | 185 - 195 | 188.5 - 200 | | |

| Item | 17 | 18 | 19 | | |
|---|---|---|---|---|---|
| Date | 6/16/10 | 6/17 | 6/18 | | |
| At 15647 | 192.5 - 197.5 | 191 - 196.5 | 191.5 - 197.5 | | |
| " 15648 | 165.5 - 169.5 | 164 - 167.5 | 164.2 - 167 | | |
| " 15649 | 186.2 - 190.0 | 184 - 188 | 183.5 - 188 | | |
| " 15650 | 198.0 - 203.5 | 194.5 - 201.5 | 195.0 - 201.5 | | |
| " 15651 | 177.5 - 180.5 | 172.5 - 176.5 | 170.0 - 174.0 | | |
| " 15652 | 194.2 - 198.7 | 190.0 - 193.2 | 186.0 - 190.7 | | |
| " 15653 | 206.5 - 213.5 | 201.5 - 208.5 | 199.5 - 207.5 | | |

SEE NOTE FOR ABOVE CELLS - ON PAGE #18 OF THIS BOOK

| Item | 49 | 50 | 51 | | |
|---|---|---|---|---|---|
| Date | 6/16/10 | 6/17 | 6/18 | | |
| At 15593 | 205.2 - 213.2 | 200 - 208.5 | 199.5 - 209 | | |
| " 15594 | 206.5 - 214 | 200.7 - 209.5 | 201.5 - 210 | | |
| " 15595 | 207 - 214.2 | 201.5 - 210 | 201.5 - 210 | | |



## Output to I.V. on 7 Hour Charge

| Item | 174 | 175 | 176 | 177 | 178 | |
|---|---|---|---|---|---|---|
| Date | 6/19 | 6-20 | 6-21 | 6-21 | 6-22 | |
| At 15 | 157.5 | 167.5 | 166 | 167.5 | 165.2 | ✓ |
| " 16 | 157.5 | 168 | 168 | 169 | 168 | |
| " 17 | 155 | 165 | 165 | 165 | 164.5 | |

| Item | 20 | 21 | 22 | 23 | |
|---|---|---|---|---|---|
| Date | 6/20 | 6-21 | 6-21 | 6-22 | |
| At 15 | 170 | 165.7 | 171 | 167.5 | ✓ |
| " 16 | 145.5 | 141.5 | 144 | 141.5 | |
| " 17 | 163 | 159 | 161 | 158.5 | |
| " 18 | 170.7 | 169.5 | 171 | 167.5 | |
| " 19 | 147.5 | 145.5 | 145 | 143 | |
| " 20 | 155.5 | 163 | 161 | 157.5 | |
| " 21 | 169.7 | 170.5 | 170.7 | 167.5 | |

| Item | 52 | 53 | 54 | 55 | |
|---|---|---|---|---|---|
| Date | 6-20 | 6-21 | 6-21 | 6-22 | |
| At 15 | 172.2 | 172 | 172 | 171 | ✓ |
| " 16 | 172.7 | 174 | 172.5 | 173 | |
| " 17 | 173.5 | 172 | 173 | 171.5 | |

## Output to 1.V & .5V. on Overcharge.

| | | | | | |
|---|---|---|---|---|---|
| Run | 339 | 340 | 341 | | |
| Date | 6/14 | 6/14 | 6/15 | | |
| A4 #646 | 183 - 205 | 181.5 - 199.5 | 182.2 - 199.5 | | |

This is one cell of the group which was used for a long series of special tests and which seldom discharged below one volt. The other two cells of the group were used for cold tests, in which they were discharged to .5V each run.

| | | | | | |
|---|---|---|---|---|---|
| Run | 396 | 397 | 398 | | |
| Date | 6/18 | 6-20 | 6-21 | | |
| A4 # 2317 | 170 - 192.5 | 170 - 188 | 172 - 190 | | |

| | | | | | |
|---|---|---|---|---|---|
| Run | 335 | 336 | 337 | | |
| Date | 6/18/10 | 6-20 | 6-21 | | |
| A4 # 3011 | 185 - 202 | 181.5 - 195.7 | 182.7 - 196.2 | | |
| " 3012 | 192.5 - 200 | 180 - 194.5 | 180 - 194.2 | | |
| " 3013 | 177.5 - 197 | 176.2 - 194 | 178 - 194.7 | | |

| | | | | | |
|---|---|---|---|---|---|
| Run | 64 | 65 | 66 | 67 | |
| Date | 6-21-10 | 6-22 | 6-23 | 6-24 | |
| A4 - 5 # 5 | 183.5 - 191.7 | 183.7 - 193 | 183.7 - 192 | 184.5 - 193.5 | |



## Output to 1.V. on 7 Hour Charge.

| | | | | | |
|---|---|---|---|---|---|
| 342 | 343 | 344 | 345 | | |
| 6/16 | 6/17 | 6/17 | 6/18 | | |
| 151 | 160 | 159 | 159.5 | | |

| | | | | | |
|---|---|---|---|---|---|
| 399 | 400 | 401 | 402 | 403 | W.E.N. |
| 6-22 | 6-23 | 6-23 | 6-24 | 6-25 | |
| 137.7 | 144 | 145 | 137 | 140 | |

Time #402 to .5V. on #401 long-cell taken

| | | | | | |
|---|---|---|---|---|---|
| 338 | 339 | 340 | 341 | 342 | W.E.N. |
| 6-22 | 6-23 | 6-23 | 6-24 | 6-25 | |
| 152.2 | 159 | 157.5 | 152.5 | 156 | |
| 149.2 | 156.7 | 155 | 151.5 | 153.5 | |
| 146 | 153.7 | 153.5 | 149.5 | 150 | |

Time #341 long-cell taken to .5V. on #340

| | | | | | |
|---|---|---|---|---|---|
| 68 | 69 | 70 | 71 | 72 | W.E.N. |
| 6-24 | 6-25 | 6-27 | 6-28 | 6-28 | |
| 166 | 163 | 167 | 166 | 165 | |